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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 8 1986

Memorandum

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Subject: 86-LA-07. Proposed Section 18 exemption for Iprodione (Rovral® 50WP; EPA Reg. No. 359-685) on Rice.
Acc. No. 169274
RCB #672

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To: Emergency Response Section
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and

Toxicology Branch
Hazard Evaluation Division (TS-769)

The Louisiana Department of Agriculture requests a section 18 specific exemption for the use of the fungicide iprodione [3-(3,5-dichlorophenyl)-N-(1-methylethyl)-2,4-dioxo-1-imidazolidinecarboxamide] on rice to control Rhizoctonia sp. The total area requiring treatment in LA will be approximately 250,000 acres. The formulation to be used is Rovral® 50WP, a 50% a.i. wettable powder made by Rhone-Poulenc Inc.

Established tolerances for the combined residues of iprodione (RP-26019), its isomer 3-(1-methylethyl)-N-(3,5-dichlorophenyl)-2,4-dioxo-1-imidazolidinecarboxamide (RP-30228), and its metabolite 3-(3,5-dichlorophenyl)-2,4-dioxo-1-imidazolidinecarboxamide (RP-32490) range from 0.05 ppm (almonds) to 150 ppm (peanut forage) for plant commodities. Established tolerances for animal commodities include an additional metabolite, N-(3,5-dichloro-4-hydroxyphenyl)ureidocarboxamide, and range from 0.5 ppm (cattle fat, meat) to 3 ppm (cattle kidney, liver) (40 CFR 180.399). All four compounds are expressed as iprodione equivalents. Tolerances are currently pending for several commodities. A registration standard has not been completed for iprodione.

The proposed use for Rovral® 50 WP on rice calls for two foliar applications at 0.5 lb.a.i./A to flooded rice fields in 10 gallons of water/A using aerial equipment. The first

application would be made at the booting stage, and the second application 14-21 days later. The interval between final application and water removal for harvest would vary between 20 and 40 days.

The metabolism of iprodione is adequately understood in plants and animals. The residues of concern consist of the compounds mentioned in the tolerances earlier.

The analytical methods used to determine residues in rice grain and straw were Rhodia Methods No. 162 and 151 respectively. Method No. 151 is similar to PAM II, Method I and measures the combined residues of iprodione (RP-26019), its isomer (RP-30228) and its metabolite (RP-30228). Method No. 162 was previously reviewed by R.W. Cook (PP#4F3129, memo 2/15/85). These methods are suitable for enforcement.

Residue data for rice grain and straw were submitted with this section 18. Flooded rice fields were treated at 0.5 lb.a.i./A for two applications at rice booting and at 14 days after booting (=1X application). Residues of three samples for each commodity were obtained at 32-58 days following the final pesticide application, and values were corrected for recovery. No recovery data, storage stability data, chromatograms or lengths of storage were submitted with this section 18. Total residues in or on rice grain and straw are summarized below.

Location	PHI	Total Residues (ppm)	
		Grain	Straw
LA	32	1.54	4.16
LA	33	8.29	9.12
LA	36	2.9	11.46
MS	32	1.17	1.72
MS	43	3.12	8.41
MS	58	0.84	0.9
AR	38	0.63	1.89
AR	42	0.2	2.98
AR	43	0.2	1.59

This data does not reflect the approximate minimum time between final application and harvest of 20 days. The shortest PHI used in obtaining this residue data is 32 days. Based on this as well as the lack of storage stability data, a statistical analysis of this data was performed to determine the likely maximum residue levels at a 20 day PHI. We conclude that maximum residues of iprodione and its metabolites will not exceed 20 ppm for rice grain and 40 ppm for rice straw.

No data were submitted for processed commodities including polished rice, hulls and milled products. Residues of iprodione can be either surface residues or residues resulting from uptake through the roots and translocation. Additionally, residues tend to accumulate in plant fractions having higher fat contents (A. Rathman, 3/2/79). In the absence of any data describing distribution of residues in rough rice, we will assume equal contribution from surface residues and translocation. Base on these considerations and the lack of residue data for these commodities, we estimate that total iprodione residues are not likely to exceed 50 ppm for rice hulls and 20 ppm for polished rice.

Grain with hulls, straw and milled by-products can be used as feed for cattle and poultry. The maximum residues likely to be found for grain with hulls and straw are 20 ppm and 40 ppm respectively. Based on the same considerations discussed above, we estimate that maximum total residues likely to be found in bran/germ/polishings is 100 ppm.

Meat, Milk, Poultry and Eggs

Rice grain with hulls and milled by-products can each constitute 25% of the diets of beef and dairy cattle; and straw can comprise 10% of the diet of beef cattle only. Therefore, total iprodione residue intake from these sources is 33 ppm for beef cattle and 30 ppm for dairy cattle. The current tolerances for the combined residues of iprodione are: cattle, goats, hogs, horses and sheep kidney and liver, and poultry liver= 3 ppm; poultry fat= 2 ppm; cattle, goats, hogs, horses and sheep meat, fat and meat byproducts except kidney and liver= 0.5 ppm; milk= 0.5 ppm; and eggs= 0.8 ppm.

A diet for beef cattle could consist of 99 ppm iprodione residues based on a diet of rice straw (10%, 4 ppm), rice milled byproducts (25%, 25 ppm), peanut hay (25%, 37.5 ppm), raisin wastes (10%, 30 ppm) and dry grape pomace (25%, 1.9 ppm). A diet for dairy cattle could consist of 116 ppm iprodione residues based on a diet of peanut hay (60%, 90 ppm); rice milled byproducts (25%, 25 ppm) and dried grape pomace (15%, 1 ppm).

In residue studies reviewed previously (M. Kovacs, 10/25/83; PP#2F2728), cattle were fed 200 ppm iprodione for 28 days. Maximum residues found together with current established tolerances are shown in the table below.

Commodity	Max. Residue Found (ppm)	Current Tolerance ppm
Cattle milk	0.389	0.5
" muscle	0.13	0.5 (meat, fat and meat byproducts except kidney and liver)
" fat	0.52	0.5 "
" liver	1.95	3
" kidney	2.87	3

Based on these considerations we conclude that the tolerances for milk; the meat, fat and meat byproducts except kidney and liver for cattle, goats, hogs, horses and sheep; and the kidney and liver of cattle, goats, hogs, horses and sheep will not be exceeded due to the increased dietary residue intake caused by iprodione use on rice as described in this section 18.

Dietary intakes of iprodione residues for turkeys/broilers and laying hens are approximately 50 ppm and 30 ppm respectively due mostly to the use on rice proposed in this section 18 (other sources are dry grape pomace: 5%, 11.25 ppm; and soapstock: 5%, 0.5 ppm).

Residue data for poultry were reviewed by R.W Cook (PP#4F3129; memo 2/15/85). Maximum residues of iprodione and its metabolites in poultry muscle at 28 days were <0.05, 0.32 and 1.68 ppm at the 2, 20 and 100 ppm feeding levels. Levels in fat were 0.18, 2.57 and 8.62 ppm; and residues in liver were 0.61, 4.10 and 13.4 ppm and in kidney were 0.33, 2.30 and 6.87 ppm respectively at the same dietary intakes. Maximum residues in eggs at 7-28 days were 0.137, 0.75 and 2.17 ppm at feeding levels of 2, 20 and 100 ppm respectively. Based on this data, we estimate that residues will not exceed the values shown in the following table when iprodione is used as proposed in this section 18. These residues could exceed the established tolerances in each case.

Commodity	Estimated Residue (ppm)	Tolerance (ppm)
Eggs	1.3	0.8
Poultry fat	5.0	2
" liver and kidney	7.5	3
" muscle	1.0	0.5 (meat and meat byproducts except kidney and liver)

The procedure used to determine residues of iprodione in crayfish was submitted with this section 18. ^{14}C labelled iprodione (location of label not specified) was dissolved

in acetone, and after determination of the activity, the solution was transferred to air dried sandy loam soil. The acetone was removed with a stream of N_2, and the soil was mixed thoroughly using a rock tumbler. This pre-mix was then mixed with stock soil and the activity of the soil was measured yeilding a ^{14}C-iprodione concentration of 1.6 ppm. The soil and untreated soil (control) were spread over the bottom of tanks to 2 cm. depth and aged for 28 days with soil moisture maintained by addition of water. Crayfish were added to both control and treated tanks and then removed at intervals (0-28 days). Total ^{14}C activity was measured at each point for both the edible portion and whole crayfish. Remaining crayfish were transferred to other tanks containing clean, flowing water, and were then removed from these tanks at intervals (0-14 days) for similar residue determination. Residue data for crayfish are shown in the table below.

		Crayfish Residues (ppm)	
	Day	Edible	Whole
Uptake			
	0		
	1	0.094	0.28
	3	0.10	0.32
	7	0.16	0.46
	10	0.20	0.38
	14	0.19	0.48
	21	0.19	0.22
	28	0.25	0.29
Depuration			
	1	0.14	0.34
	3	0.21	0.44
	7	0.079	0.12
	10	0.051	0.33
	14	0.039	0.12

These data do not reflect conditions which might be present if iprodione were applied as described in the proposed use. The soil concentration used in the study (1.6 ppm) does reflect the approximate maximum soil concentration found for application at the proposed use rate. However, the concentration of pesticide in water is lower in the study than under actual use conditions by a factor of 10 (30 in one sample) for approximately the first week of crayfish exposure.

However, for the purposes of this section 18, we estimate that residues of iprodione in or on whole crayfish will not exceed 2.0 ppm and in the edible portion of crayfish will not exceed 1.0 ppm when iprodione is applied as described in the proposed use.

Conclusions

(1) The metabolism of iprodione in both plants and animals is adequately understood.

(2) Residues are not likely to exceed the values shown in the following table when Rovral® 50WP is applied as proposed in this section 18.

Commodity	Max. Likely Residue (ppm)	Tolerance ppm
Rice grain	20	-
Rice straw	40	-
Polished rice	20	-
Rice hulls	50	-
Rice bran/germ/polishings	100	-
Meat and meat byproducts except kidney and liver of cattle, goats, hogs, horses and sheep	0.5	0.5
Kidney and liver of cattle, goats, hogs, horses and sheep	3	3
Milk	0.5	0.5
Eggs	1.3	0.8
Poultry fat	5.0	2
Poultry liver and kidney	7.5	3
Poultry muscle	1.0	0.5
Crayfish (whole)	2	-
Crayfish (edible)	1	-

(3) Analytical methods are available for enforcement [PAM II, Method I (straw); Rhodia Method No. 162 (grain); Method ADC No. 623 (animal tissue); Method ADC Nos. 623-A and 623-B (milk and tissues respectively)] (see PP#2F2728, M. Kovacs 10/25/82 and PP#3F2964, R. Cook 2/21/84).

(4) Analytical reference standards are available from the Pesticides and Industrial Chemicals Repository.

Recommendations

TOX considerations permitting, RCB has no objection to this section 18. An agreement should be made with the FDA and the USDA regarding the legal status of the treated commodities in commerce since this proposed use may result in residues exceeding the existing tolerances for poultry and eggs.

cc:iprodione (Rovral)S.F.,R.F.,Section 18 S.F.,Circu,M.Metzger, PMSD/ISB
RDI:E.Zager:EZ:4/8/86:RDS:4/8/86
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